

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 09 March 2010 have been fully considered but they are not persuasive. Applicant argues that Lyu does not disclose a description of an IPS LCD or describe how a VATN LCD is adapted to an IPS display. However, Lyu discloses that the disclosed device may comprises an IPS device (column 11, lines 42-46), and because VATN and IPS methods are well-known in the art as equivalent technologies. All IPS devices operate as claim 1 recites, "wherein liquid crystal molecules of said medium are reoriented by application of an electric field that has a major component substantially parallel to the substrates", and therefore, Applicant's arguments are not persuasive, since one of ordinary skill in the art would understand how both VATN and IPS devices operate, and Lyu discloses both.
2. Applicant's arguments, see page 3, filed 09 March 2010, with respect to the rejection(s) of claim(s) 1 under 35 § USC 102(e) have been fully considered and are persuasive, particularly in that Lyu fails to disclose the limitations of one first and second retardation film comprising optically uniaxial positive calamitic liquid crystal material. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of additional prior art.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 4-6, 12-18, 20, and 25-33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyu et al. (US 6,646,701) in view of Chung et al. (US 5,995,184), and in further view of Taber et al. (US 5,731,886).

5. Regarding claim 1, Lyu discloses an IPS LCD (see figure 12B, for instance), said display comprising a switchable liquid crystal cell (50) sandwiched between two polarizers (10, 11), said liquid crystal cell comprising a layer of a liquid crystal medium between two plane parallel substrates at least one of which is transparent to incident light, wherein the liquid crystal molecules of said medium are reoriented by application of an electric field that has a major component substantially parallel to the substrate (column 11, lines 42-45), at least one first retardation film (20) having an optical axis substantially parallel to the film plane (column 7, lines 8-9) wherein said at least one first retardation film is designated an +A plate, and only one second retardation film (30) having an optical axis substantially perpendicular to the film plane (column 7, lines 9-11), wherein said second retardation film is designated the +C plate, wherein the at least one +A plate and the only one +C plate are situated on the same side of said switchable liquid crystal cell (see figure 12B), and said only one +C plate is closer than said at least one +A plate to the polarizer that is on the same side of said switchable liquid crystal cell as said at least one +A plate and said only one +C plate, and the optical axis of said at least one +A plate is parallel to the stretch axis of the polarizer (see figure 12B) that is situated on the same side of said switchable liquid crystal cell as said at least one +A plate and said only one +C plate. However, Lyu does not expressly

disclose the at least one first retardation film and only one second retardation film comprising optically uniaxial positive calamitic liquid crystal material.

6. Regarding claim 1, Chung discloses an LCD device having an a-plate, wherein the a-plate comprises optically uniaxial calamitic liquid crystal material (column 2, lines 49-52).

7. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the a-plate of Chung in the LCD of Lyu. The motivation for doing so would have been to use a retardation plate that can be easily combined with other optical elements and used for in a variety of conditions for ease of manufacture and use, as taught by Chung (see column 7, lines 44-63).

8. Regarding claim 1, Taber discloses a c-plate comprising optically uniaxial positive calamitic liquid crystal material (see claim 8 of Taber, for instance).

9. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the c-plate of Taber in the LCD of Lyu view of Chung. The motivation for doing so would have been to use a birefringent layer that contributes to increased backlight efficiency and improved field of view characteristics, as taught by Taber (see column 2, lines 32-33). Claim 1 is therefore unpatentable.

10. Regarding claim 2, Lyu in view of Chung and in further view of Taber discloses a liquid crystal display according to claim 1 (see Lyu figure 12B, for instance), wherein said display comprises only one +A plate and only one +C plate (see Lyu figure 12B). Claim 2 is therefore unpatentable.

11. Regarding claim 4, Lyu in view of Chung and in further view of Taber discloses a liquid crystal display according to claim 1 (see figure 12B, for instance), wherein the at least one +A plate and/or the only one +C plate comprise polymerized or crosslinked calamitic liquid crystal material (see Chung column 2, lines 49-52; Taber claim 8). Claim 4 is therefore unpatentable.

12. Regarding claim 5, Lyu in view of Chung and in further view of Taber discloses a liquid crystal display according to claim 1 (see figure 12B, for instance), wherein the at least one +A plate comprises polymerized polymerised or crosslinked calamitic liquid crystal material with planar orientation (see Chung column 2, lines 49-52). Claim 5 is therefore unpatentable.

13. Regarding claim 6, Lyu in view of Chung and in further view of Taber discloses a liquid crystal display according to claim 1 (see figure 12B, for instance), wherein the only one +C plate comprises polymerized or crosslinked calamitic LC material with homeotropic orientation (see Taber claim 8). Claim 6 is therefore unpatentable.

14. Regarding claim 12, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 1 (see figure 12B, for instance), wherein the at least one +A plate and the only one +C plate are situated between the liquid crystal cell and the polarizer (see Lyu figure 12B). Claim 12 is therefore unpatentable.

15. Regarding claim 13, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 1 (see figure 12B, for instance), wherein the thickness of the at least one +A plate is from 0.6 to 1.6 μm (see Lyu column 9, 29-34). Claim 13 is therefore unpatentable.

16. Regarding claim 14, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 1 (see Allen figures 4-5, for instance), wherein the thickness of the +C plate is from 0.4 to 1.0 μm (see Lyu column 9, 29-34). Claim 14 is therefore unpatentable.

17. Regarding claim 15, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 1 (see figure 12B, for instance), wherein the optical retardation $d_a\Delta n_a$ of the at least one +A plate is from 50 to 200 nm (see Lyu claim 2). Claim 15 is therefore unpatentable.

18. Regarding claim 16, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 1 (see figure 12B, for instance), wherein the optical retardation $d\Delta n$ of the only +C plate is from 30 to 150 nm (see Lyu claim 3, and column 9, 29-34). Claim 16 is therefore unpatentable.

19. Regarding claim 17, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 1 (see figure 12B, for instance), wherein the optical retardation $d_a\Delta n_a$ of the at least one +A plate is from 69 to 184 nm (see Lyu claim 3). Claim 17 is therefore unpatentable.

20. Regarding claim 18, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 1 (see figure 12B, for instance), wherein the optical retardation $d\Delta n$ of the +C plate is from 46 to 115 nm (Lyu column 9, 29-34). Claim 18 is therefore unpatentable.

21. Regarding claim 20, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 1 (see figure 12B, for instance), wherein the positions of the individual components are selected from the following configuration:

22.	P(90)	23.	C	24.	A(90)	25.	LC(0)	26.	P(0)
-----	-------	-----	---	-----	-------	-----	-------	-----	------

27. Claim 20 is therefore unpatentable.

28. Regarding claim 25, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 4 (see figure 12B, for instance), wherein the at least one +A plate comprises polymerized liquid crystal material obtained from polymerizable LC material comprising: 5 - 70 % by weight of one or more direactive achiral mesogenic compounds, 30 - 95 % by weight of one or more monoreactive achiral mesogenic compounds, and 0 to 10 % by weight of one or more photoinitiators (see Chung column 7, lines 44-63). Claim 25 is therefore unpatentable.

29. Regarding claim 26, Lyu in view of Chung and in further view of Taber discloses a liquid crystal display according to claim 4 (see figure 12B, for instance), wherein the only one +C plate comprises polymerized liquid crystal material obtained from polymerizable LC material comprising: 5 - 70 % by weight of one or more direactive achiral mesogenic compounds, 30 - 95 % by weight of one or more monoreactive achiral mesogenic compounds, and 0 to 10 % by weight of one or more photoinitiators (see Chung column 7, lines 44-6). Claim 26 is therefore unpatentable.

30. Regarding claim 27, Lyu in view of Chung and in further view of Taber discloses a liquid crystal display according to claim 25 (see figure 12B, for instance), wherein the only one +C plate comprises polymerized liquid crystal material obtained from

polymerizable LC material comprising: 5 - 70 % by weight of one or more di reactive achiral mesogenic compounds, 30 - 95 % by weight of one or more monoreactive achiral mesogenic compounds, and 0 to 10 % by weight of one or more photoinitiators (see Chung column 7, lines 44-6). Claim 27 is therefore unpatentable.

31. Regarding claim 28, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 1 (see figure 12B, for instance), wherein the positions of the individual components are selected from the following configuration:

32. S	33. P(90)	34. C	35. S	36. A(90)	37. LC(0)	38. S	39. P(0)	40. S
41. S	42. P(90)	43. S	44. LC(0)	45. A(0)	46. S	47. C	48. P(0)	49. S

50. wherein S denotes a transparent substrate. Claim 28 is therefore unpatentable.

51. Regarding claim 29, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 28 (see figure 12B, for instance), wherein the positions of the individual components are selected from the following configuration:

52. S	53. P(90)	54. C	55. S	56. A(90)	57. LC(0)	58. S	59. P(0)	60. S
-------	-----------	-------	-------	-----------	-----------	-------	----------	-------

61. wherein S denotes a transparent substrate. Claim 29 is therefore unpatentable.

62. Regarding claim 30, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 28 (see figure 12B, for instance), wherein the positions of the individual components are selected from the following configuration:

63. S	64. P(90)	65. S	66. LC(0)	67. A(0)	68. S	69. C	70. P(0)	71. S
-------	-----------	-------	-----------	----------	-------	-------	----------	-------

72. wherein S denotes a transparent substrate. Claim 30 is therefore unpatentable.

73. Regarding claim 31, Lyu in view of Chung and in further view of Taber discloses the LCD according to claim 29 (see figure 12B, for instance), wherein S in each case is

independently a stretched plastic film selected from TAC, DAC, and PVA films (see Chung column 8, lines 1-6). Claim 31 is therefore unpatentable.

74. Regarding claim 32, Lyu in view of Chung and in further view of Taber discloses the LCD according to claim 30 (see figure 12B, for instance), wherein S in each case is independently a stretched plastic film selected from TAC, DAC, and PVA films (see Chung column 8, lines 1-6). Claim 32 is therefore unpatentable.

75. Regarding claim 33, Lyu in view of Chung and in further view of Taber discloses the LCD according to claim 5 (see figure 12B, for instance), wherein only one +C plate comprises polymerized or crosslinked calamitic LC material with homeotropic orientation (see Taber claim 8). Claim 33 is therefore unpatentable.

76. Regarding claim 35, Lyu in view of Chung and in further view of Taber discloses the LCD according to claim 1 (see figure 12B, for instance), the thickness of said at least one +A plate is from 0.6 to 1.6 μm ; the thickness of said only one +C plate is from 0.4 to 1.0 μm ; the optical retardation $d_A \cdot \Delta n_a$ of said at least one +A plate is from 50 to 200 nm; and the optical retardation $d \cdot \Delta n$ of said only one +C plate is from 30 to 150 nm (see Lyu claim 3, and column 9, 29-34). Claim 35 is therefore unpatentable.

77. Claims 10 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyu et al. (US 6,646,701) in view of Chung et al. (US 5,995,184), and in further view of Taber et al. (US 5,731,886), as applied to claim 1 above, and further in view of Moon et al. (US 6,882,386).

78. Regarding claims 10 and 34, Lyu in view of Chung and in further view of Taber discloses an LCD according to claim 1 (see figure 12B, for instance). However, Lyu in

view of Chung and in further view of Taber does not expressly disclose wherein the at least one +A plate and/or the only one +C plate are situated between the substrates of the liquid crystal cell, or wherein only one +A plate is situated between the substrates of the LC cell.

79. Regarding claims 10 and 34, Moon discloses an LCD having a retardation layer (see figure 6, for instance) the retardation layer is situated between the substrates of the liquid crystal cell.

80. It would have been obvious to one of ordinary skill in the art at the time the invention was made to situate the a-plate and/or c-plate between the LC cell substrates as Moon in the LCD of Lyu in view of Chung and in further view of Taber. The motivation for doing so would have been to reduce thickness of the device while also increasing luminance by preventing light leakage, as taught by Moon (see column 3, lines 1-6). Claims 10 and 34 are therefore unpatentable.

Conclusion

81. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHANAEL R. BRIGGS whose telephone number is (571)272-8992. The examiner can normally be reached on 9 AM - 5:30 PM Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nathanael Briggs
3/30/2010

/David Nelms/
Supervisory Patent Examiner, Art Unit 2871